

2. Real Numbers

Extra Questions

➤ Classify the decimal form of the given rational numbers into terminating and non-terminating recurring type.(1mark)

1) $\frac{4}{5}$

Ans : Since, 5 is the only prime factor in the denominator

∴ the decimal form of rational number $\frac{4}{5}$ will be terminating type.

or method (II)

$$\begin{array}{r}
 0.8 \\
 \hline
 5 \overline{) 40} \\
 \underline{- 0} \\
 40 \\
 \underline{- 40} \\
 00
 \end{array}$$

∴ $\frac{4}{5}$ is terminating type

2) $\frac{1}{5}$

Ans : Since, 5 is the only prime factor in the denominator.

∴ the decimal form of rational number $\frac{1}{5}$ will be terminating type.

or method (II) 0.2

$$\begin{array}{r}
 5 \overline{) 1.0} \\
 \underline{- 0} \\
 10 \\
 \underline{- 10} \\
 00
 \end{array}$$

$\therefore \frac{1}{5}$ is terminating type

3) $\frac{16}{11}$

Ans : Since, the denominator is other than prime factors 2 or 5

$\therefore$ the decimal form of rational number $\frac{16}{11}$ will be non-terminating type recurring type.

or method (II)

$$\begin{array}{r}
 1.4545.... \\
 11 \overline{) 16.0000} \\
 \underline{- 11} \quad \downarrow \\
 50 \quad \downarrow \\
 \underline{- 44} \quad \downarrow \\
 60 \quad \downarrow \\
 \underline{- 55} \quad \downarrow \\
 50 \quad \downarrow \\
 \underline{- 44} \quad \downarrow \\
 60 \quad \downarrow \\
 \underline{- 55} \\
 05
 \end{array}$$

$\therefore \frac{16}{11} = 1.454545$

$$\therefore \frac{16}{11} = 1.\overline{45}$$

$\therefore \frac{16}{11}$ is non-terminating recurring type

4) $\frac{2}{3}$

Ans : Since, the denominator is other than prime factors 2 or 5.

$\therefore$ the decimal form of the rational number $\frac{2}{3}$ will be non-terminating recurring type.

or method (II)

$$\begin{array}{r}
 1.666 \\
 \hline
 3 \overline{) 2.000} \\
 \underline{- 0} \\
 20 \\
 \underline{- 18} \\
 20 \\
 \underline{- 18} \\
 20 \\
 \underline{- 18} \\
 02
 \end{array}$$

$$\therefore \frac{2}{3} = 0.666 \dots = 0.\dot{6}$$

$\therefore \frac{2}{3}$ is non-terminating recurring type.

Write the following rational numbers in decimal form. (3M)

5) $3\frac{1}{8}$

Ans : Given, $3\frac{1}{8} = \frac{3 \times 8 + 1}{8} = \frac{24 + 1}{8} = \frac{25}{8}$

$$\begin{array}{r}
 3.125 \\
 8 \overline{) 25.000} \\
 \underline{- 24} \\
 10 \\
 \underline{- 8} \\
 20 \\
 \underline{- 16} \\
 40 \\
 \underline{- 40} \\
 00
 \end{array}$$

$\therefore 3\frac{1}{8} = \frac{25}{8} = 3.125$

6) $3\frac{4}{5}$ (CBSE 2015)

Ans : Given, $3\frac{4}{5} = \frac{3 \times 5 + 4}{5} = \frac{15 + 4}{5} = \frac{19}{5}$

$$\begin{array}{r}
 3.8 \\
 5 \overline{) 19.0} \\
 \underline{- 15} \\
 40 \\
 \underline{- 40} \\
 00
 \end{array}$$

$\therefore 3\frac{4}{5} = \frac{19}{5} = 3.8$

$$7) \frac{135}{1125}$$

Ans :

$$\begin{array}{r} 0.12 \\ 1125 \overline{) 135.00} \\ \underline{- 15} \\ 1350 \\ \underline{- 1125} \\ 2250 \\ \underline{- 2250} \\ 0000 \end{array}$$

$$\therefore \frac{135}{1125} = 0.12$$

8) Which of the following rational number is in nonterminating recurring decimal form 1) $\frac{17}{99}$ 2) $\frac{7}{12}$

Ans : 1)

$$\begin{array}{r} 0.171717.... \\ 99 \overline{) 17.0000} \\ \underline{- 0} \\ 170 \\ \underline{- 99} \\ 710 \\ \underline{- 693} \\ 170 \\ \underline{- 99} \\ 710 \\ \underline{- 693} \\ 17 \end{array}$$

$$\therefore \frac{17}{99} = 0.1717 \dots$$

$$\therefore \frac{17}{99} = 0.\overline{17}$$

Ans :- (2)

$$\begin{array}{r}
 0.5833 \\
 12 \overline{) 7} \\
 \underline{- 0} \\
 70 \\
 \underline{- 60} \\
 100 \\
 \underline{- 96} \\
 040 \\
 \underline{- 36} \\
 040 \\
 \underline{- 36} \\
 04
 \end{array}$$

$$\therefore \frac{7}{12} = 0.5833 \dots$$

$$\therefore \frac{7}{12} = 0.58\dot{3}$$

$\frac{17}{99}, \frac{7}{12}$ both are non-terminating recurring type.

➤ Write the following national numbers in $\frac{p}{q}$ form (3 mark)

9) $0.\dot{2}$ (CBSE 2016)

Ans : Let $x = 0.\dot{2} = 0.222\dots\dots\dots$ (i)

Since, one number i.e. 2 is repeating after decimal point.

Thus, multiplying both sides by 10

$$10x = 2.222 \dots\dots\dots \text{ (ii)}$$

Subtracting (ii) from (i)

$$10x - x = 2.\dot{2} - 0.\dot{2}$$

$$9x = 2$$

$$\therefore x = \frac{2}{9}$$

$$\therefore 0.\dot{2} = \frac{2}{9}$$

10) $17.\overline{82}$

Ans : let $x = 17.\overline{82} = 17.8282 \dots\dots\dots$ (i)

Multiplying both sides by 100,

$$100x = 17.\overline{82} \dots\dots\dots$$
 (ii)

Subtracting (ii) from (i)

$$100x - x = 1782.\overline{82} - 17.82$$

$$\therefore 99x = 1765$$

$$x = \frac{1765}{99}$$

$$\therefore 17.\overline{82} = \frac{1765}{99}$$

11) $0.\overline{513}$

Ans : let $x = 0.\overline{513} = 0.513513 \dots\dots\dots$ (i)

Multiplying both sides by 1000.

$$1000x = 513.513 \dots\dots\dots$$
 (ii)

Subtracting (ii) from (i),

$$\therefore 1000x - x = 513.513 - 0.513$$

$$\therefore 999x = 513$$

$$\therefore x = \frac{513}{999}$$

$$\therefore 0.\overline{513} = \frac{513}{999}$$

12) $0.\overline{3178}$ (CBSE2015)

Ans : let $x = 0.\overline{3178} = 0.31783178 \dots\dots\dots$ (i)

Multiplying both sides by 10000,

$$10000x = 3178.3178 \dots\dots\dots$$
 (ii)

Subtracting (ii) from (i),

$$\therefore 10000x - x = 3178.3178 - 0.3178$$

$$\therefore 9999x = 3178$$

$$\therefore x = \frac{3178}{9999}$$

$$\therefore 0.\overline{3178} = \frac{3178}{9999}$$

13) Show that $5\sqrt{2}$ is an irrational number. (4mark)

Ans : let us assume that $5\sqrt{2}$ is a rational number. so, we can find co-prime integers 'a' and 'b' ($b \neq 0$) such that.

$$5\sqrt{2} = \frac{a}{b}$$

$$\therefore 5b\sqrt{2} = a$$

Squaring both sides,

$$(5)^2 b^2 (\sqrt{2})^2 = a^2$$

$$25b^2 \times 2 = a^2$$

$$50b^2 = a^2 \dots\dots\dots (i)$$

$$\therefore b^2 = \frac{a^2}{50}$$

Since 50 divides a^2 , so 50 divides 'a' as well.

So, we write $a = 50c$, where c is an integer.

$$\therefore a^2 = (50c)^2 \dots\dots\dots [\text{squaring both sides}]$$

$$\therefore 50b^2 = 50 \times 50c^2 \dots\dots\dots [\text{from (i)}]$$

$$\therefore b^2 = 50c^2$$

$$\therefore c^2 = \frac{b^2}{50}$$

Since, 50 divides b^2 , so 50 divides 'b'

$\therefore$ 50 divides both a and b

$\therefore$ a and b have at least 50 as a common factor but this contradicts the fact that a and b have no common factor other than 1.

$\therefore$ our assumption that $5\sqrt{2}$ is a rational number is wrong.

$\therefore 5\sqrt{2}$ is an irrational number.

14) Prove that $6 + \sqrt{7}$ is an irrational number. (4 mark)

Ans : Let $6 + \sqrt{7}$ not be an irrational number.

It means $6 + \sqrt{7}$ is a rational number.

If $6 + \sqrt{7}$ is rational then let $6 + \sqrt{7} = \frac{p}{q}$

$$\therefore \text{we get } \sqrt{7} = \frac{p}{q} - 6$$

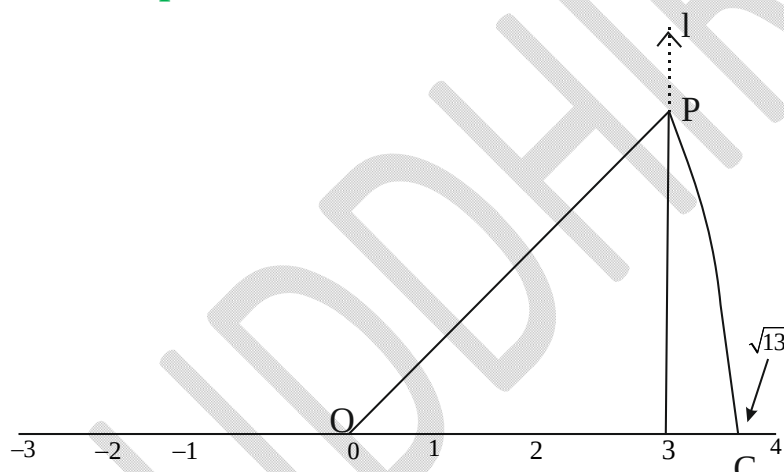
In this equation left side = $\sqrt{7}$ is an irrational number. and right side = $\frac{p}{q} - 6$ is rational number, which is contradictory.

$\therefore 6 + \sqrt{7}$ is a rational number is not correct.

$\therefore 6 + \sqrt{7}$ is an irrational number.

15) Represent the number $\sqrt{13}$ on a number line [CBSE2015]
(4 mark)

Ans : To represent $\sqrt{13}$ on the number line.



Take a number line with O as zero. Mark point A on it such that $OA = 3$ units. Draw a line $AP = 2$ units passing through A and perpendicular to line l . Join OP.

Then $OP = \sqrt{13}$ units.

Draw an arc with centre O and radius OP, which intersects the number line at C.

Then, C represents $\sqrt{13}$ on the number line. In right angle triangle ΔOAP ,

$$OP^2 = OA^2 + AP^2$$

$$OP^2 = 3^2 + 2^2$$

$$OP^2 = 9 + 4$$

$$OP^2 = 13$$

$$\therefore OP = \sqrt{13}$$

$$\therefore OC = \sqrt{13}$$

Hence verified.

16) Write any four rational numbers between -3 and -4 .

Ans : -3.1, -3.2, -3.3, -3.9.

17) Write any three rational numbers between 6.2 and 6.3

(1 mark)

Ans : - 6.21, 6.22, 6.23,

Write the following root of numbers may be rational or irrational verify it. (2 mark)

18) 3^6

Ans : - $3^6 = 729$

$\therefore 3$ is the 6th root of 729.

But if $x^6 = 4$ then $x = \sqrt[6]{4}$ which is an irrational number.

19) 4^4

Ans : - $4^4 = 256$

$\therefore 4$ is the 4th root of 256 but if $x^4 = 4$ then $x = \sqrt[4]{4}$ which is an irrational number.

➤ State which of the following are surds. Justify (2 marks)

20) $\sqrt[3]{17}$

Ans : $\sqrt[3]{17}$ is surd because 17 is a positive rational number, 3 is a positive integer greater than 1 and $\sqrt[3]{17}$ is irrational.

21) $\sqrt[3]{64}$

Ans : $\sqrt[3]{64}$ is not surd because $\sqrt[3]{64} = 4$ is not irrational number.

22) $\frac{1}{\sqrt{15}}$

Ans : $\frac{1}{\sqrt{15}}$ is surd because $\sqrt{15}$ is irrational number.

$\therefore \frac{1}{\sqrt{15}}$ is irrational number.

➤ Classify the given pair of surds into like surds and unlike surds. (2 marks)

23) $\sqrt{75}, \sqrt{147}$

Ans : $\sqrt{75} = \sqrt{25 \times 3} = 5\sqrt{3}$

$\sqrt{147} = \sqrt{49 \times 3} = 7\sqrt{3}$

$\therefore \sqrt{75}, \sqrt{147}$ are like surds.

24) $\sqrt{117}, 3\sqrt{2}$

Ans : $\sqrt{117} = \sqrt{9 \times 13} = 3\sqrt{13}$

And $3\sqrt{2}$

$\therefore \sqrt{117}, 3\sqrt{2}$ are unlike surds.

Express the following surds are pure surds. (2 marks)

25) $4\sqrt{5}$

$$\begin{aligned}\text{Ans : } &= \sqrt{4^2 \times 5} \\ &= \sqrt{16 \times 5} \\ &= \sqrt{80}\end{aligned}$$

$$\therefore 4\sqrt{5} = \sqrt{80}$$

26) $3\sqrt{6}$

$$\begin{aligned}\text{Ans : } &= \sqrt{3^2 \times 6} \\ &= \sqrt{9 \times 6} \\ &= \sqrt{54}\end{aligned}$$

$$\therefore 3\sqrt{6} = \sqrt{54}$$

➤ Simplify the following surds . (2 marks)

27) $\sqrt{882}$

$$\begin{aligned}\text{Ans : } &= \sqrt{2 \times 441} \\ &= \sqrt{2 \times 3 \times 147} \\ &= \sqrt{2 \times 3 \times 3 \times 49}\end{aligned}$$

$$\begin{aligned}\therefore \sqrt{882} &= \sqrt{2 \times 9 \times 49} \\ &= 3 \times 7\sqrt{2}\end{aligned}$$

$$= 21\sqrt{2}$$

$$28) \sqrt{98}$$

$$\begin{aligned}\text{Ans : } &= \sqrt{98} \\ &= \sqrt{2 \times 49} \\ &= 7\sqrt{2}\end{aligned}$$

➤ Compare the following pair of surds. (2 marks)

$$29) 5\sqrt{6}, 6\sqrt{5}$$

$$\text{Ans : } 5\sqrt{6} = \sqrt{5^2 \times 6} = \sqrt{25 \times 6} = \sqrt{150}$$

$$6\sqrt{5} = \sqrt{6^2 \times 5} = \sqrt{36 \times 5} = \sqrt{180}$$

$$\therefore \sqrt{150} < \sqrt{180}$$

$$\therefore 5\sqrt{6} < 6\sqrt{5}$$

$$30) 3\sqrt{17}, 19\sqrt{2}$$

$$\text{Ans : } 3\sqrt{17} = \sqrt{3^2 \times 17} = \sqrt{9 \times 17} = \sqrt{153}$$

$$19\sqrt{2} = \sqrt{19^2 \times 2} = \sqrt{361 \times 2} = \sqrt{722}$$

$$\therefore \sqrt{153} < \sqrt{722}$$

$$\therefore 3\sqrt{17} < 19\sqrt{2}$$

$$31) 4\sqrt{7}, 5\sqrt{2}$$

$$\text{Ans : } 4\sqrt{7} = \sqrt{4^2 \times 7} = \sqrt{16 \times 7} = \sqrt{112}$$

$$5\sqrt{2} = \sqrt{5^2 \times 2} = \sqrt{25 \times 2} = \sqrt{50}$$

$$\therefore \sqrt{112} > \sqrt{50}$$

$$\therefore 4\sqrt{7} > 5\sqrt{2}$$

➤ Simplify. (3 marks)

$$32) \frac{3}{5}\sqrt{7} + 2\sqrt{7}$$

$$\text{Ans : } \frac{3}{5}\sqrt{7} + 2\sqrt{7}$$

$$= \left(\frac{3}{5} + 2\right) \sqrt{7}$$

$$= \left(\frac{3+5 \times 2}{5}\right) \sqrt{7}$$

$$= \frac{13}{5} \sqrt{7}$$

$$33) \frac{1}{4}\sqrt{243} + \sqrt{\frac{27}{4}}$$

$$\text{Ans : } \frac{1}{4}\sqrt{3 \times 81} + \frac{\sqrt{3 \times 9}}{2}$$

$$= \frac{1}{4} 9\sqrt{3} + \frac{3\sqrt{3}}{2}$$

$$= \frac{9}{4}\sqrt{3} + \frac{3}{2}\sqrt{3}$$

$$= \left(\frac{9}{4} + \frac{3}{2}\right) \sqrt{3}$$

$$= \left(\frac{9}{4} + \frac{3 \times 2}{2 \times 2}\right) \sqrt{3}$$

$$= \left(\frac{9}{4} + \frac{6}{4}\right) \sqrt{3}$$

$$= \frac{15}{4} \sqrt{3}$$

$$34) \sqrt{7} - \frac{2}{5} \sqrt{7}$$

$$\text{Ans : } 1\sqrt{7} - \frac{2}{5} \sqrt{7}$$

$$= \left(1 - \frac{2}{5}\right) \sqrt{7}$$

$$= \left(\frac{5-2}{5}\right) \sqrt{7}$$

$$= \frac{3}{5} \sqrt{7}$$

$$35) 6\sqrt{32} - \sqrt{18} - \sqrt{2}$$

$$\text{Ans : } 6\sqrt{16 \times 2} - \sqrt{9 \times 2} - \sqrt{2}$$

$$= 6 \times 4\sqrt{2} - 3\sqrt{2} - \sqrt{2}$$

$$= 24\sqrt{2} - 3\sqrt{2} - \sqrt{2}$$

$$= (24 - 3 - 1) \sqrt{2}$$

$$= 20\sqrt{2}$$

$$36) \sqrt{24} \times \sqrt{27}$$

$$\text{Ans : } \sqrt{24} \times \sqrt{27}$$

$$= \sqrt{24 \times 27}$$

$$= \sqrt{648}$$

$$= \sqrt{2 \times 324}$$

$$= \sqrt{2 \times 3 \times 108}$$

$$= \sqrt{2 \times 3 \times 2 \times 54}$$

$$\begin{aligned}
 &= \sqrt{12 \times 54} \\
 &= \sqrt{12 \times 3 \times 18} \\
 &= \sqrt{36 \times 18} \\
 &= 6 \times 3\sqrt{2} \\
 &= 18\sqrt{2}
 \end{aligned}$$

$$37) 4\sqrt{12} \times 7\sqrt{16}$$

$$\begin{aligned}
 \text{Ans : } &4\sqrt{12} \times 7\sqrt{16} \\
 &= 4 \times 7\sqrt{12 \times 16} \\
 &= 28 \times 4\sqrt{12} \\
 &= 112\sqrt{12} \\
 &= 112\sqrt{4 \times 3} \\
 &= 112 \times 2\sqrt{3} \\
 &= 224\sqrt{3}
 \end{aligned}$$

$$38) \sqrt{147} \div \sqrt{3}$$

$$\begin{aligned}
 \text{Ans : } &\frac{\sqrt{147}}{\sqrt{3}} \\
 &= \frac{\sqrt{3 \times 49}}{\sqrt{3}} \\
 &= \frac{7\sqrt{3}}{\sqrt{3}} \\
 &= 7
 \end{aligned}$$

$$39) 4\sqrt{28} \div 3\sqrt{7}$$

$$\text{Ans : } \frac{4\sqrt{28}}{3\sqrt{7}}$$

$$= \frac{4\sqrt{4 \times 7}}{3\sqrt{7}}$$

$$= \frac{4 \times 2\sqrt{7}}{3\sqrt{7}}$$

$$= \frac{8\sqrt{7}}{3\sqrt{7}}$$

$$= \frac{8}{3}$$

➤ Rationalize the denominator . (4 marks)

$$40) \frac{-5}{2\sqrt{5}}$$

$$\text{Ans : } \frac{-5}{2\sqrt{5}}$$

$$= \frac{-5}{2\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$$

$$= \frac{-5\sqrt{5}}{2\sqrt{5} \times \sqrt{5}}$$

$$= \frac{-5\sqrt{5}}{2(\sqrt{5})^2}$$

$$= \frac{-5\sqrt{5}}{2 \times 5}$$

$$= \frac{-5\sqrt{5}}{10}$$

$$= \frac{-\sqrt{5}}{2}$$

41) $\frac{5}{\sqrt{27}}$

Ans : $\frac{5}{\sqrt{3 \times 9}}$

$$= \frac{5}{3\sqrt{3}}$$

$$= \frac{5}{3\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$= \frac{5\sqrt{3}}{3 \times \sqrt{3} \times \sqrt{3}}$$

$$= \frac{5\sqrt{3}}{3 \times (\sqrt{3})^2}$$

$$= \frac{5\sqrt{3}}{3 \times 3}$$

$$= \frac{5\sqrt{3}}{9}$$

42) Rationalize the denominator $\frac{8}{7-3\sqrt{5}}$ (CBSE 2017). (4 marks)

Ans : The conjugate pair of $7-3\sqrt{5}$ is $7 + 3\sqrt{5}$

$$\therefore \frac{8}{7-3\sqrt{5}} = \frac{8}{7-3\sqrt{5}} \times \frac{7+3\sqrt{5}}{7+3\sqrt{5}} \dots\dots\dots [\text{multiplying the numerator and denominator by } 7+3\sqrt{5}]$$

$$= \frac{8 \times (7+3\sqrt{5})}{(7-3\sqrt{5})(7+3\sqrt{5})} \dots\dots\dots [\because (a-b)(a+b) = a^2 - b^2]$$

$$= \frac{8 \times (7+3\sqrt{5})}{(7)^2 - (3\sqrt{5})^2}$$

$$\begin{aligned}
 &= \frac{8 \times (7+3\sqrt{5})}{49-9 \times 5} \\
 &= \frac{8 (7+3\sqrt{5})}{49-45} \\
 &= \frac{8 (7+3\sqrt{5})}{4} \\
 &= 2 (7 + 3\sqrt{5})
 \end{aligned}$$

$$43) \frac{6}{2\sqrt{3}+\sqrt{6}}$$

$$\text{Ans : } \frac{6}{2\sqrt{3}+\sqrt{6}}$$

The conjugate pair of $2\sqrt{3} + \sqrt{6}$ is $2\sqrt{3} - \sqrt{6}$

$$\begin{aligned}
 &= \frac{6}{2\sqrt{3}+\sqrt{6}} \times \frac{2\sqrt{3}-\sqrt{6}}{2\sqrt{3}-\sqrt{6}} \dots [\text{multiplying the numerator} \\
 &\quad \text{and denominator by } 2\sqrt{3} - \sqrt{6}] \\
 &= \frac{6 \times (2\sqrt{3}-\sqrt{6})}{(2\sqrt{3}+\sqrt{6})(2\sqrt{3}-\sqrt{6})} \dots [\because (a-b)(a+b) = a^2 - b^2]
 \end{aligned}$$

$$\begin{aligned}
 &= \frac{12\sqrt{3}-6\sqrt{6}}{4 \times 3 - 6} \\
 &= \frac{12\sqrt{3}-6\sqrt{6}}{12-6} \\
 &= \frac{12\sqrt{3}-6\sqrt{6}}{6} \\
 &= \frac{12\sqrt{3}}{6} - \frac{6\sqrt{6}}{6} \\
 &= 2\sqrt{3} - \sqrt{6}
 \end{aligned}$$

➤ Find the value . (2 mark)

$$44) |5 \times (-4) + 4 \times (-5)|$$

$$\text{Ans : } |-20 + (-20)|$$

$$= |-20 - 20|$$

$$= |-40|$$

$$= 40$$

$$45) |7(5 - 7) - 3 \times (4 - 5)|$$

$$\text{Ans : } |7(-2) - 3(-1)|$$

$$= |7(-2) + 3|$$

$$= |-14 + 3|$$

$$= |-11|$$

$$= 11$$

$$46) |-3| \times |7|$$

$$\text{Ans : } |-3| \times |7|$$

$$= |3| \times |7|$$

$$= |21|$$

$$= 21$$

$$47) \left| 5 - \frac{1}{2}x \right| = \frac{1}{4} \text{ .(3 mark)}$$

$$\text{Ans : } 5 - \frac{1}{2}x = \frac{1}{4} \quad \text{or} \quad 5 - \frac{1}{2}x = \frac{-1}{4}$$

$$\frac{-x}{2} = \frac{1}{4} - 5 \quad \text{or} \quad \frac{-x}{2} = \frac{-1}{4} - 5$$

$$\frac{-x}{2} = \frac{1-20}{4} \quad \text{or} \quad \frac{-x}{2} = \frac{-20-1}{4}$$

$$\frac{-x}{2} = \frac{-19}{4} \quad \text{or} \quad \frac{-x}{2} = \frac{-21}{4}$$

$$x = \frac{19}{2} \quad \text{or} \quad x = \frac{21}{2}$$

48) $\left|x - \frac{1}{2}\right| = \frac{3}{2}$. (3 mark)

Ans : $x - \frac{1}{2} = \frac{3}{2}$ or $x - \frac{1}{2} = \frac{-3}{2}$

$$\frac{2x-1}{2} = \frac{3}{2} \quad \text{or} \quad \frac{2x-1}{2} = \frac{-3}{2}$$

$$2x - 1 = 3 \quad \text{or} \quad 2x - 1 = -3$$

$$2x = 3 + 1 \quad \text{or} \quad 2x = -3 + 1$$

$$2x = 4 \quad \text{or} \quad 2x = -2$$

$$x = \frac{4}{2} \quad \text{or} \quad x = \frac{-2}{2}$$

$$x = 2 \quad \text{or} \quad x = -1$$

49) $|4x - 2| = 10$. (3 mark)

Ans : $4x - 2 = 10$ or $4x - 2 = -10$

$$4x = 10 + 2 \quad \text{or} \quad 4x = -10 + 2$$

$$4x = 12 \quad \text{or} \quad 4x = -8$$

$$x = \frac{12}{4} \quad \text{or} \quad x = \frac{-8}{4}$$

$$x = 3 \quad \text{or} \quad x = -2$$

50) show that $\frac{1}{2+\sqrt{3}} + \frac{2}{\sqrt{5}-\sqrt{3}} + \frac{1}{2-\sqrt{5}} = 0$ (CBSE2017). (4 m)

$$\text{Ans : } \frac{1}{2+\sqrt{3}} + \frac{2}{\sqrt{5}-\sqrt{3}} + \frac{1}{2-\sqrt{5}}$$

$$= \frac{1}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} + \frac{2}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} + \frac{1}{2-\sqrt{5}} \times \frac{2+\sqrt{5}}{2+\sqrt{5}}$$

$$= \frac{2-\sqrt{3}}{(2)^2-(\sqrt{3})^2} + \frac{2(\sqrt{5}+\sqrt{3})}{(\sqrt{5})^2-(\sqrt{3})^2} + \frac{2+\sqrt{5}}{(2)^2-(\sqrt{5})^2}$$

$$= \frac{2-\sqrt{3}}{4-3} + \frac{2(\sqrt{5}+\sqrt{3})}{5-3} + \frac{2+\sqrt{5}}{4-5}$$

$$= \frac{2-\sqrt{3}}{1} + \frac{2(\sqrt{5}+\sqrt{3})}{2} + \frac{2+\sqrt{5}}{(-1)}$$

$$= 2-\sqrt{3} + \sqrt{5} + \sqrt{3} -2 -\sqrt{5}$$

$$= 0$$
